

FIG. 1

Composition analysis value		CaCO ₃	SiO ₂	WO ₃	Coercive force (HcJ)	Residual Magnetic Flux Density (Br)	Phases
a	b	[wt%]	[wt%]	[wt%]	[Oe]	[G]	
2.0	12.6	1.0	0.5	0.5	2627	4432	W phase
	12.8				2631	4426	
	13.0				3003	4415	
	13.2				3024	4423	
	13.4				3035	4406	
	13.6				3032	4409	
	13.8				3045	4416	
	14.0				3069	4410	
	14.2				3046	4412	
	14.4				3118	4400	
	14.6				3150	4425	
	14.8				3130	4430	
	15.0				3321	4424	
	15.2				3325	4412	
	15.4				3299	4403	
	15.6				3327	4461	
	15.8				3382	4428	
	16.0				3327	4403	
	16.2				3241	4409	
	16.4				3241	4281	
	16.6				3199	4309	
1.9	16.2	1.0	0	0.3	743	4652	W phase
			0.1		1093	4647	
			0.5		3193	4498	
			1.0		3075	4421	
			1.5		2051	4049	
2.1	15.8	1.0	0.5	0	2781	4593	W phase
				0.1	3024	4512	
				0.3	3199	4492	
				0.5	3376	4449	
				1.0	3491	4432	
				1.5	3652	4403	
				2.0	3791	4275	W phase + M phase
				3.0	4505	3881	M phase + W phase + S phase
				4.0	3736	3231	M phase + S phase + W phase
				5.0	1880	2481	M phase + S phase + W phase

FIG. 2

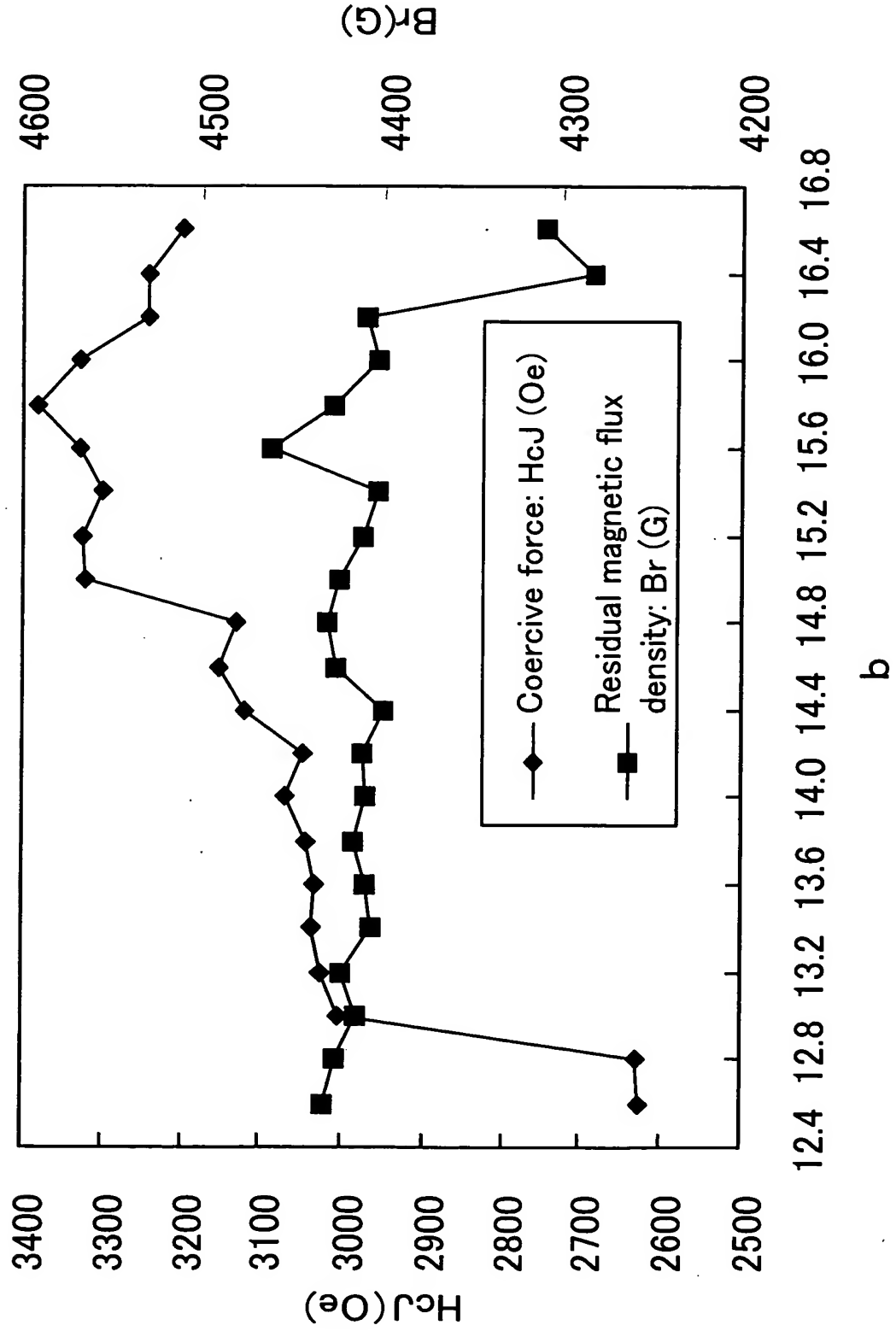


FIG. 3

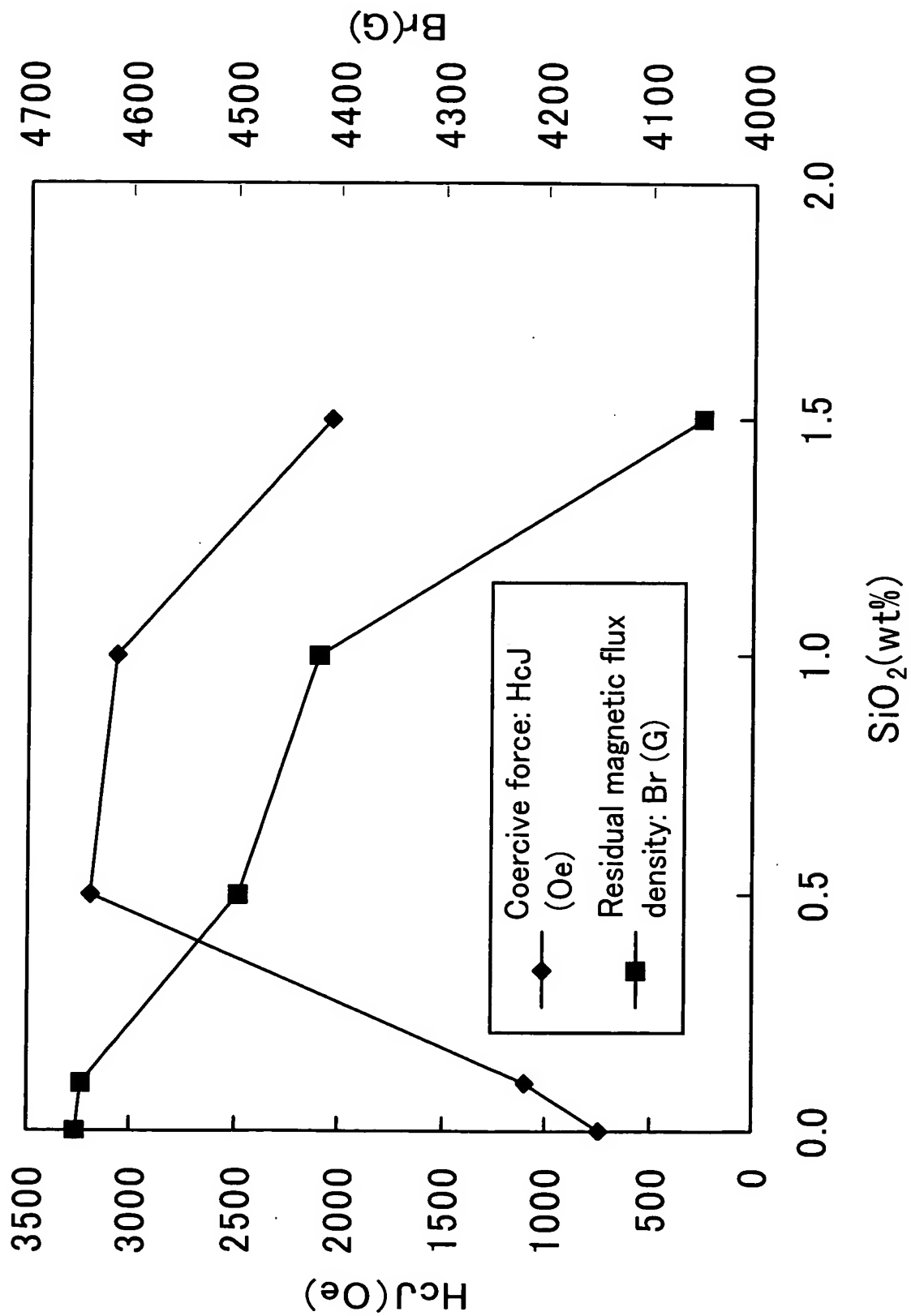


FIG. 4

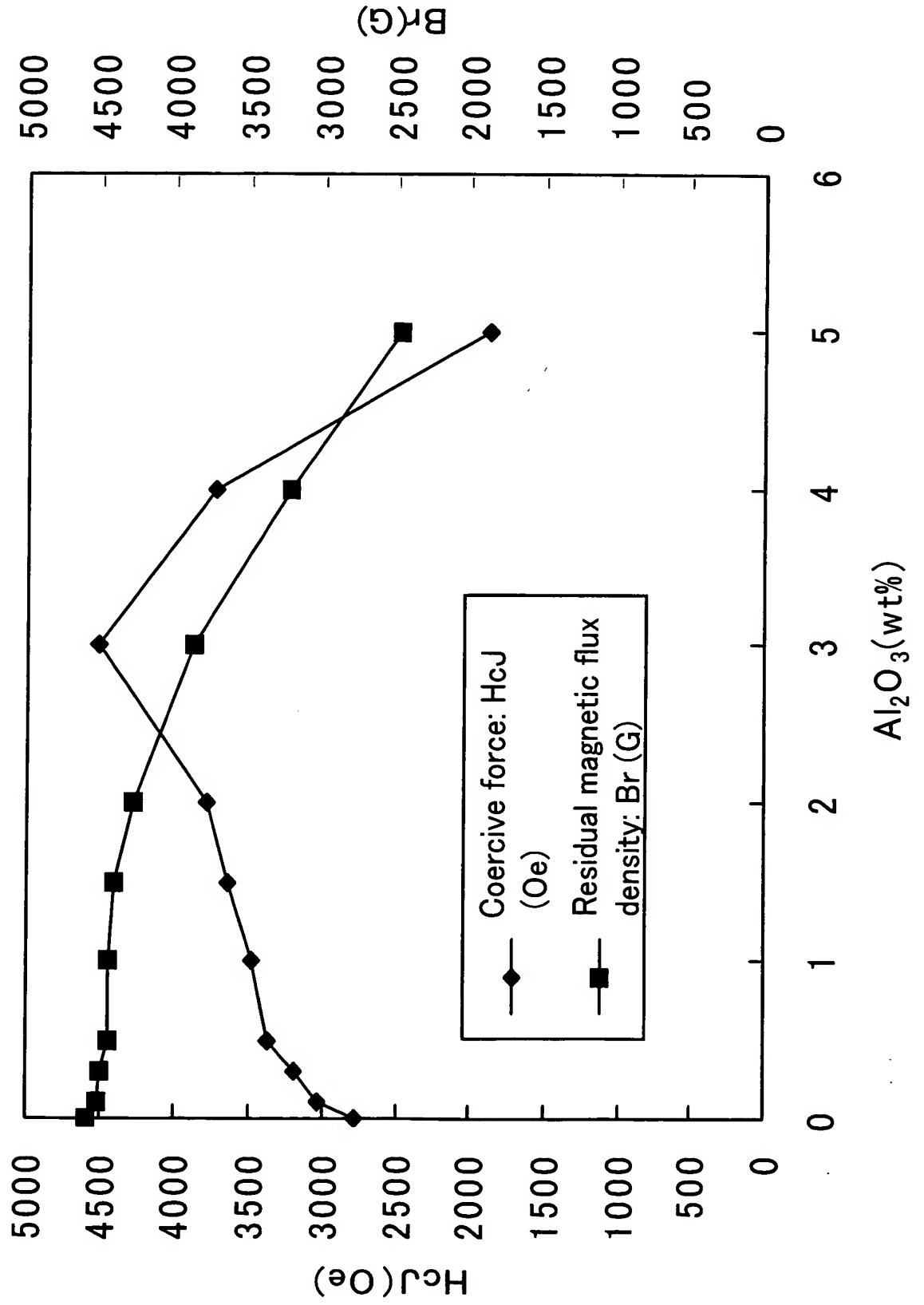


FIG. 5

Composition analysis value		CaCO ₃	SiO ₂	WO ₃	Coercive force (HcJ)	Residual Magnetic Flux Density (Br)	Phases
a	b	[wt%]	[wt%]	[wt%]	[Oe]	[G]	
2.0	12.4	0.7	0.45	0.1	2611	4423	W phase
	12.8				2891	4416	
	13.2				3009	4407	
	13.6				3005	4412	
	14.0				3024	4421	
	14.4				3033	4411	
	14.8				3046	4428	
	15.2				3035	4426	
	15.6				3050	4465	
	16.0				3052	4446	
	16.4				3015	4279	
	16.6				3006	4301	
1.9	16.2	0.7	0	0.1	823	4630	W phase
			0.15		1236	4553	
			0.45		3042	4451	
			0.90		3051	4405	
			1.50		2106	4003	
2.0	16.0	0.7	0.45	0	2948	4452	W phase
				0.1	3046	4446	
				0.3	3055	4446	
				0.5	3046	4421	
				0.7	2938	4364	W phase + H phase
				1.0	2900	4315	

FIG. 6

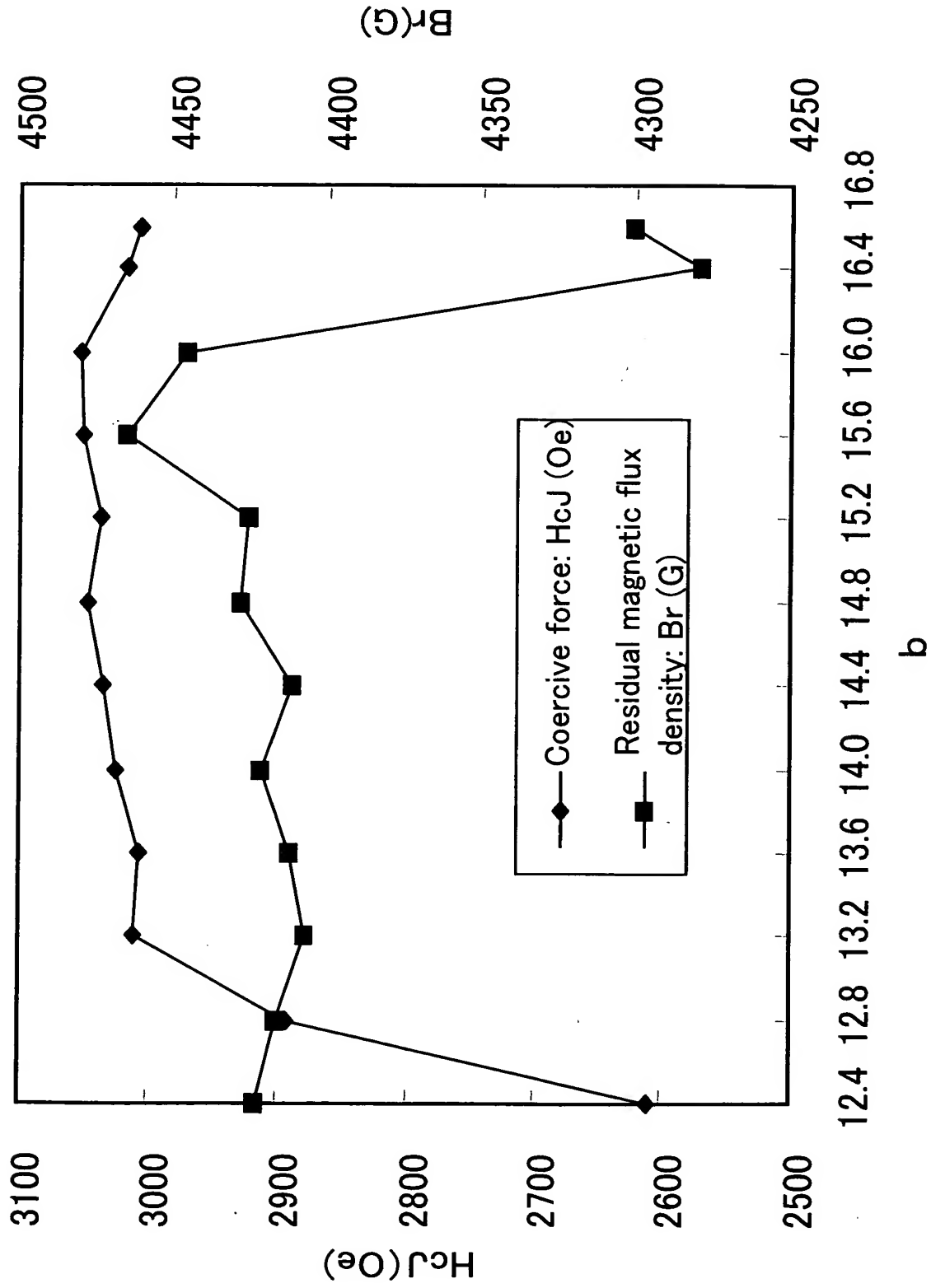


FIG. 7

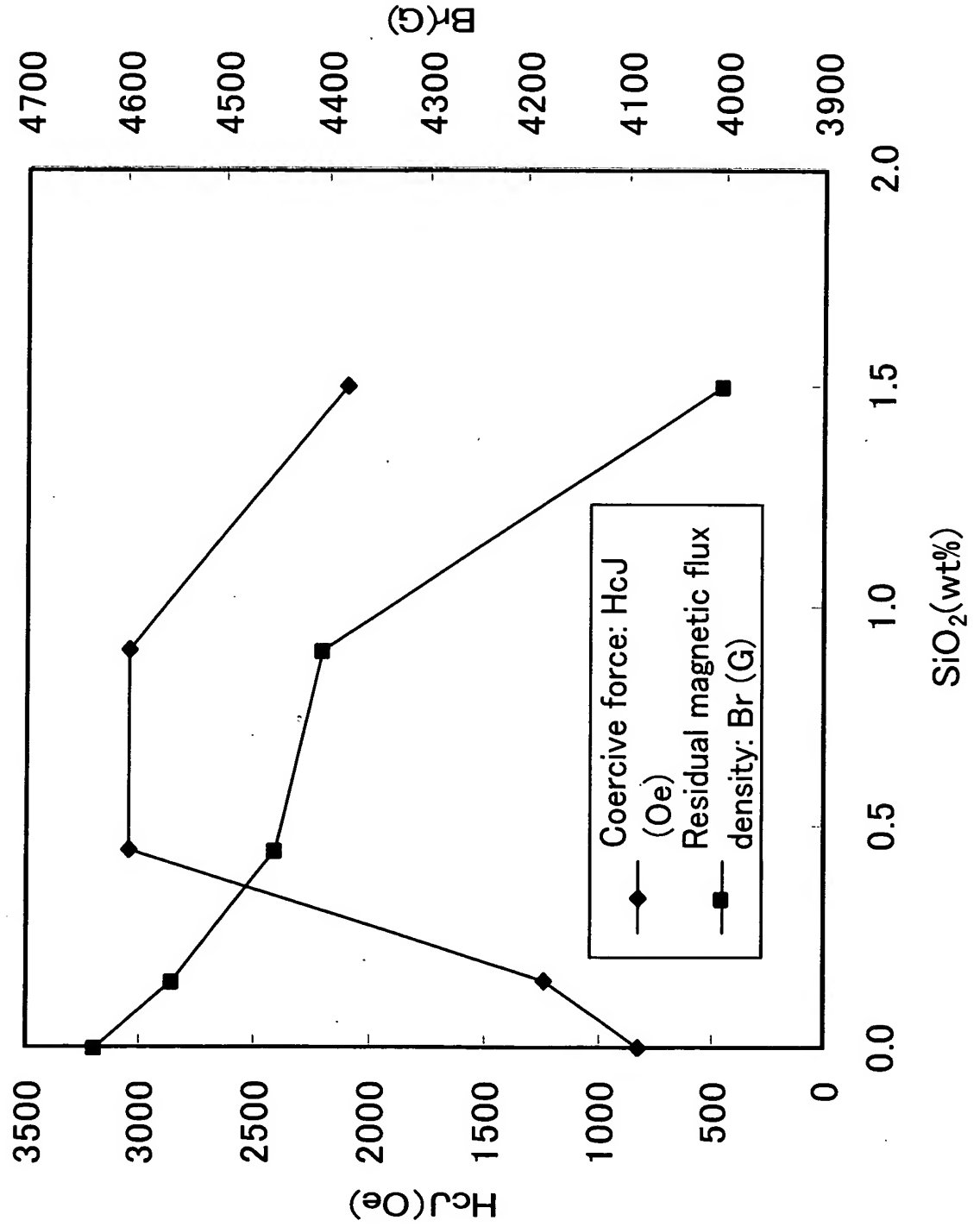


FIG. 8

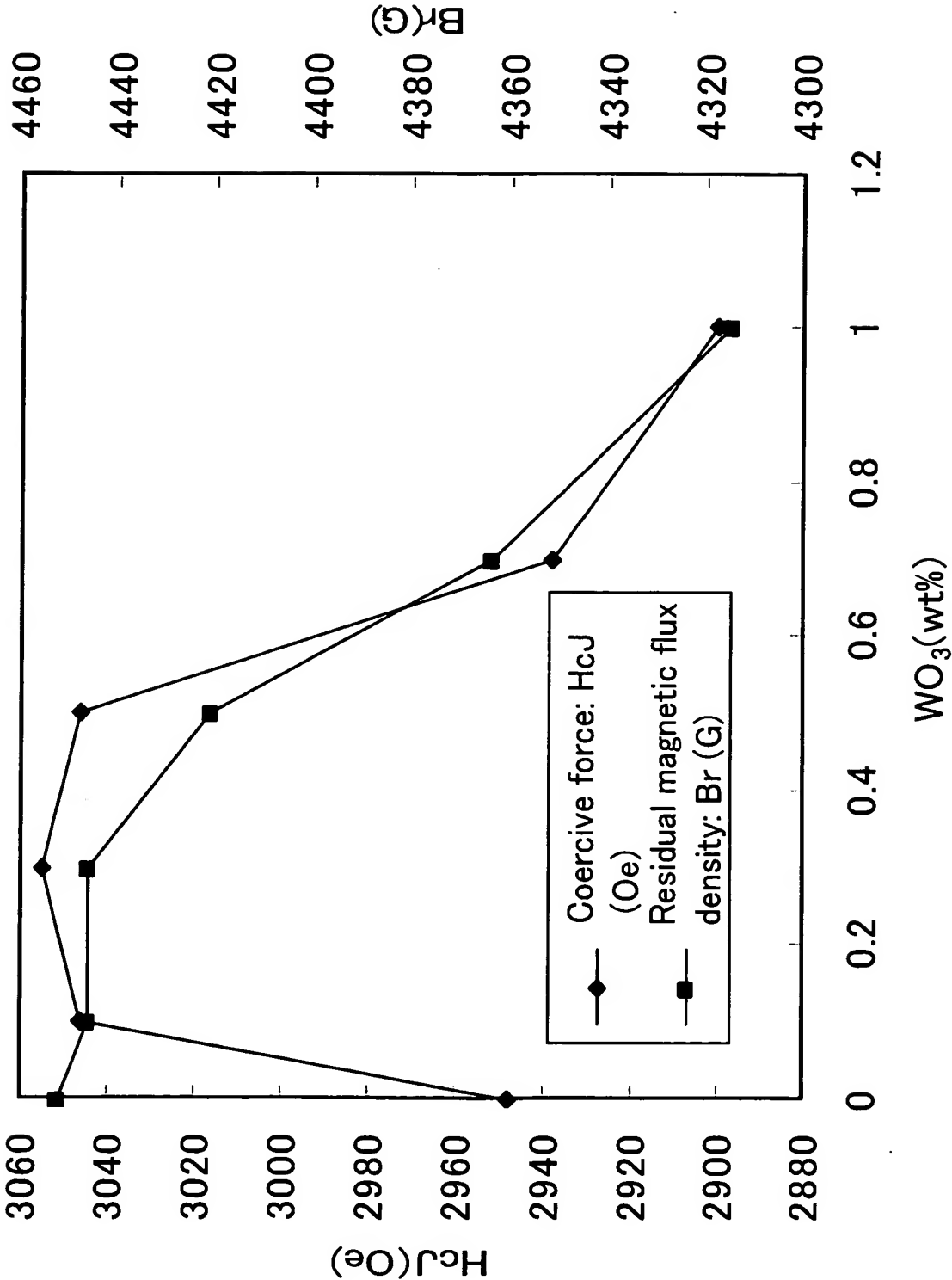
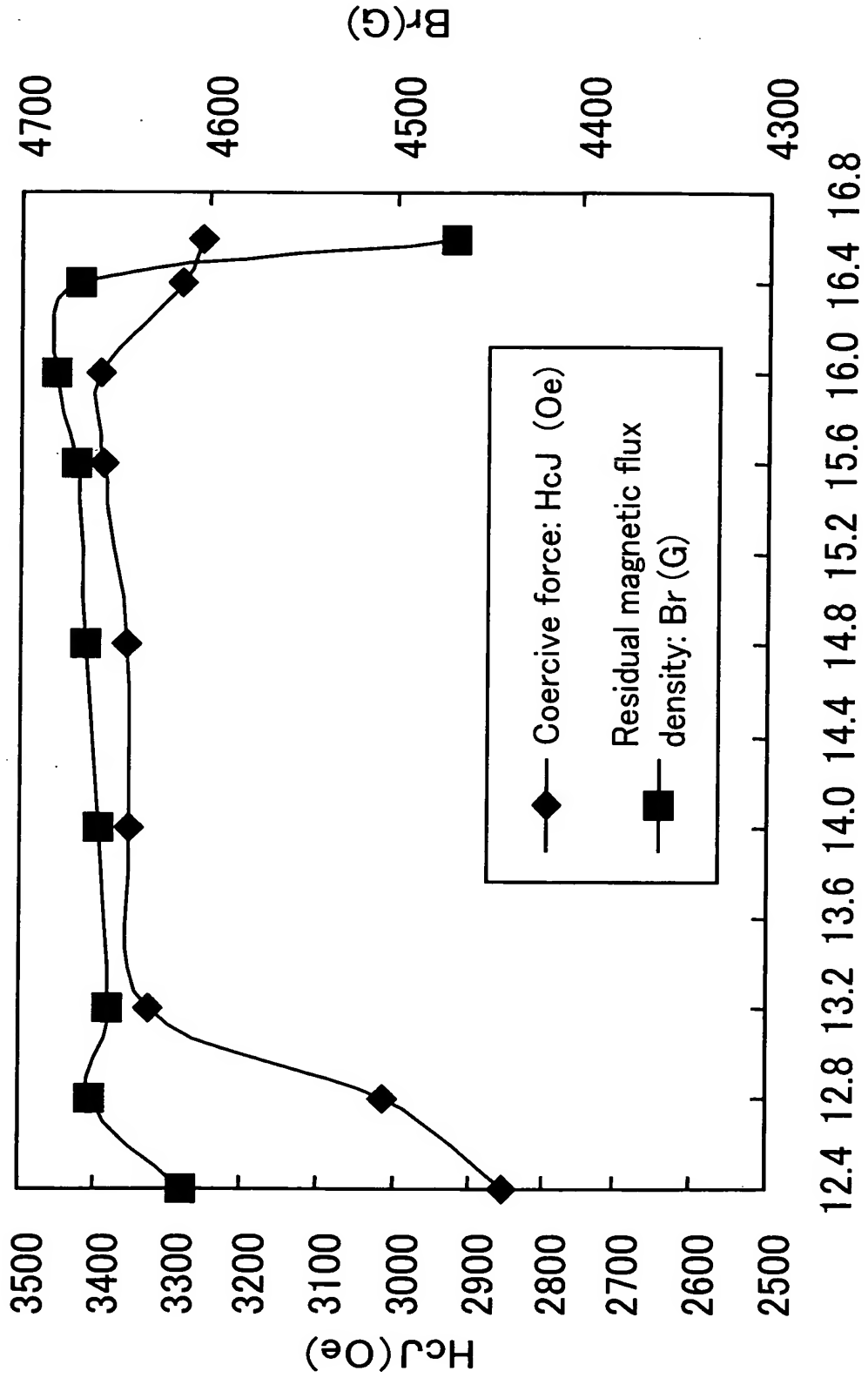


FIG. 9

Composition analysis value		CaCO ₃	SiO ₂	CeO ₂	Coercive force (HcJ)	Residual Magnetic Flux Density (Br)	Phases
a	b	[wt%]	[wt%]	[wt%]	[Oe]	[G]	
2.0	12.4	0.7	0.6	0.1	2855	4612	W phase
	12.8				3012	4661	
	13.2				3325	4653	
	14.0				3351	4658	
	14.8				3356	4666	
	15.6				3391	4670	
	16.0				3395	4681	
	16.4				3284	4668	
	16.6				3256	4468	
1.9	16.2	0.7	0	0.1	2989	4750	W phase
			0.2		3340	4675	
			0.6		3382	4654	
			0.9		3362	4605	
			1.5		3150	4402	
2.0	16.0	0.7	0.6	0	3284	4666	W phase
				0.05	3388	4678	
				0.1	3395	4663	
				0.3	3370	4654	
				0.5	3356	4632	
				0.7	3285	4589	W phase + M phase

FIG. 10



b

FIG. 11

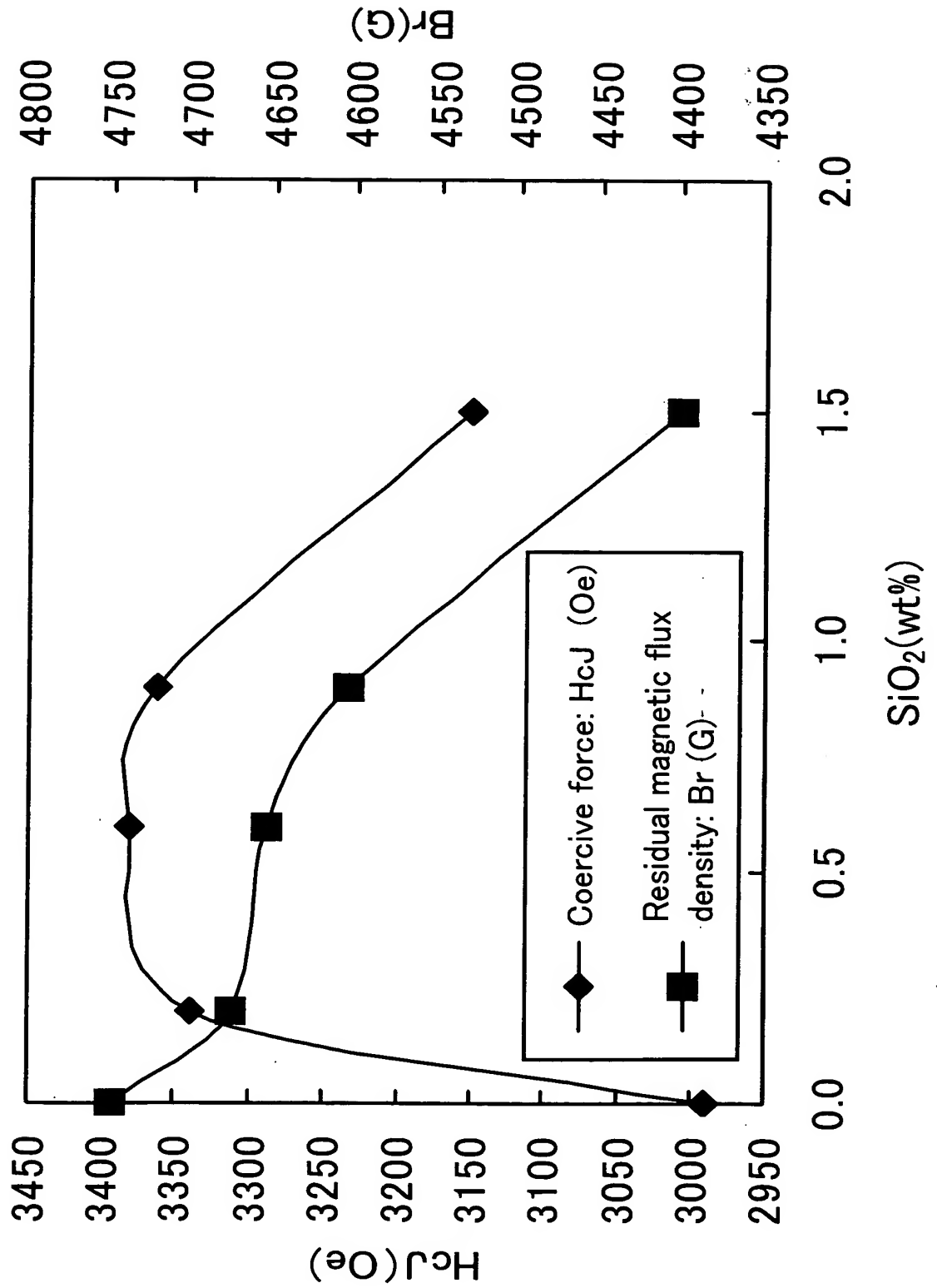


FIG. 12

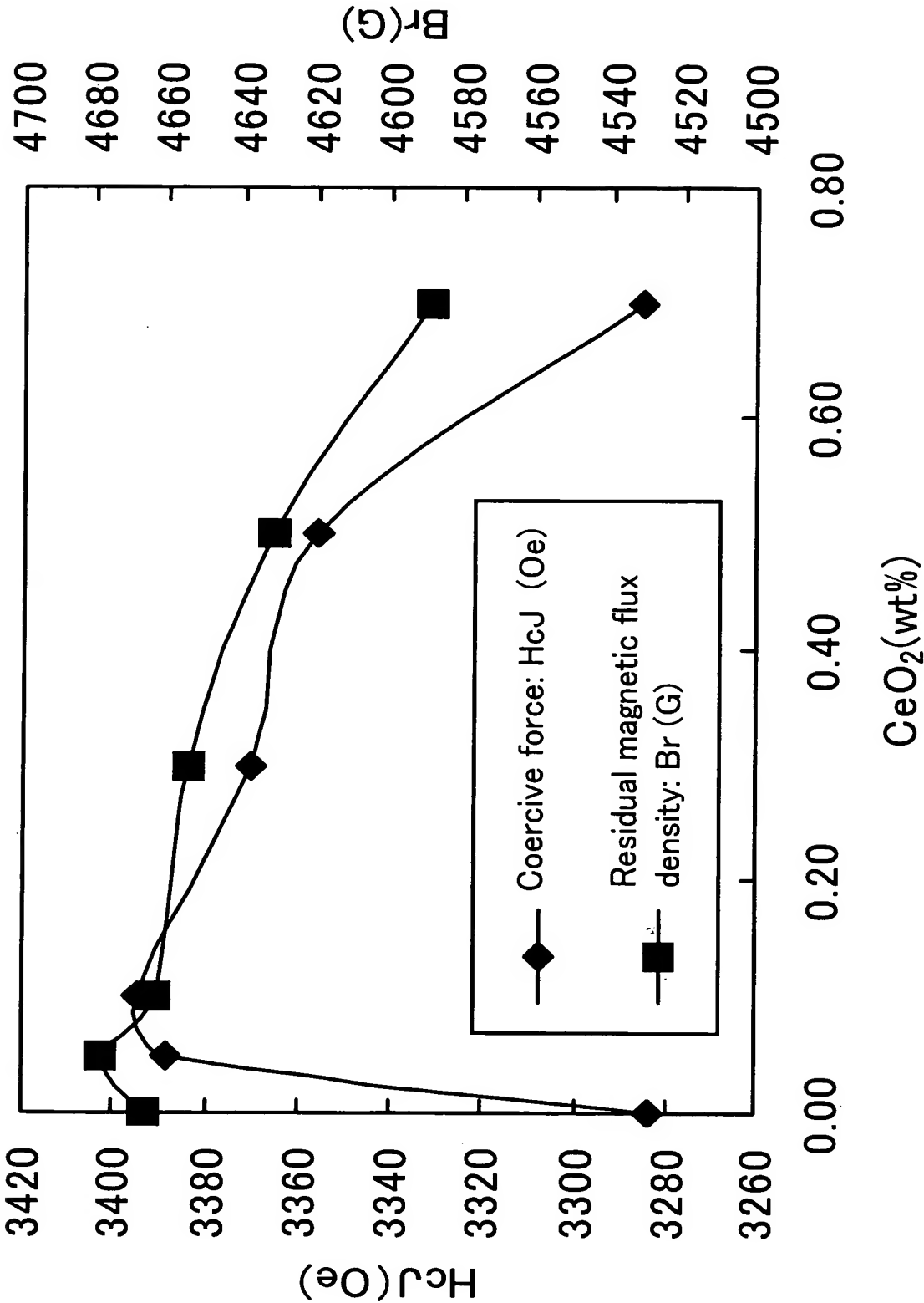


FIG. 13

Composition analysis value		CaCO ₃	SiO ₂	MoO ₃	Al ₂ O ₃	WO ₃	CeO ₂	Coercive force (HcJ)	Residual Magnetic Flux Density (Br)	Phases
a	b	[wt%]	[wt%]	[wt%]	[wt%]	[wt%]	[wt%]	[Oe]	[G]	
2.0	12.4	0.7	0.6	0.02	-	-	-	2759	4612	W phase
	12.8				-	-	-	3212	4610	
	13.2				-	-	-	3412	4613	
	14.0				-	-	-	3395	4625	
	14.8				-	-	-	3383	4635	
	15.6				-	-	-	3342	4635	
	16.0				-	-	-	3320	4649	
	16.4				-	-	-	3206	4627	
	16.6				-	-	-	3256	4352	
1.9	16.2	0.7	0	0.02	-	-	-	1981	4715	W phase
			0.1		-	-	-	3215	4682	
			0.5		-	-	-	3395	4655	
			1.0		-	-	-	3362	4606	
			1.5		-	-	-	3148	4420	
2.1	15.8	0.7	0.6	0	-	-	-	3284	4686	W phase
				0.01	-	-	-	3382	4672	
				0.02	-	-	-	3400	4666	
				0.05	-	-	-	3425	4658	
				0.10	-	-	-	3368	4642	
				0.15	-	-	-	3342	4628	
1.9	16.2	0.7	0.6	0.20	-	-	-	3104	4552	W phase + H phase
				-	0.60	0.10	-	3685	4602	W phase
				-	0.60	-	0.10	3677	4605	
				0.02	0.60	-	-	3690	4601	

FIG. 14

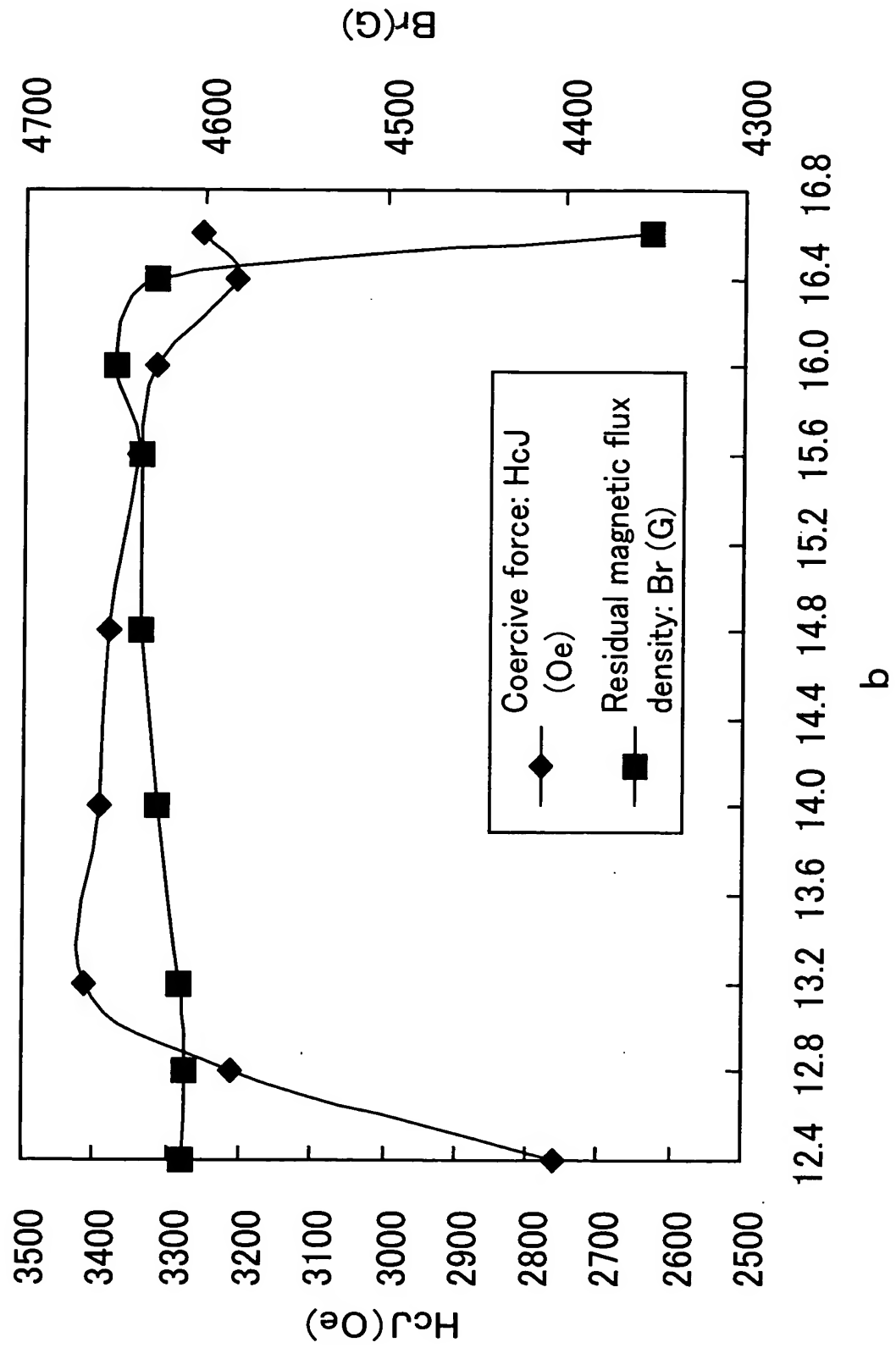


FIG. 15

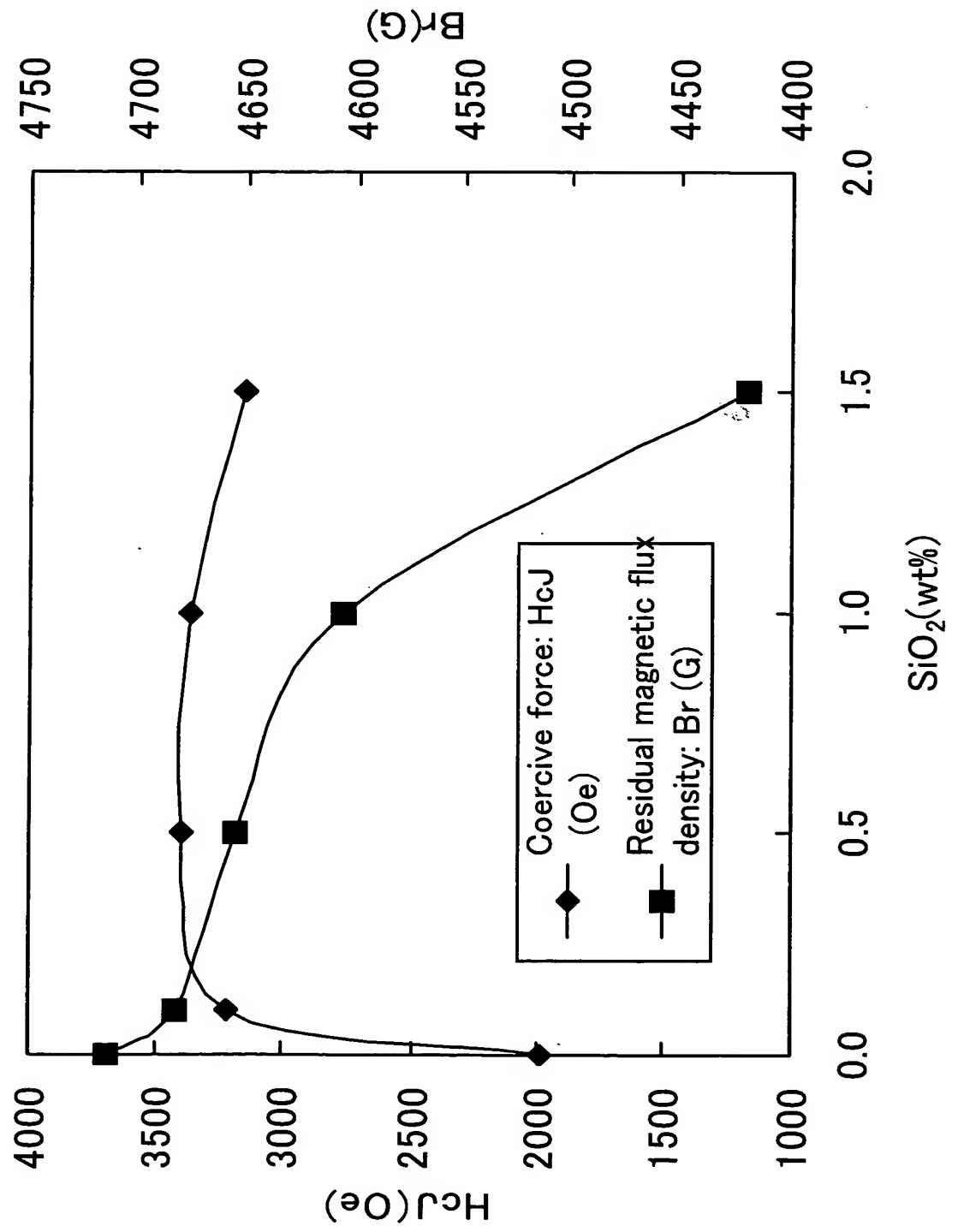


FIG. 16

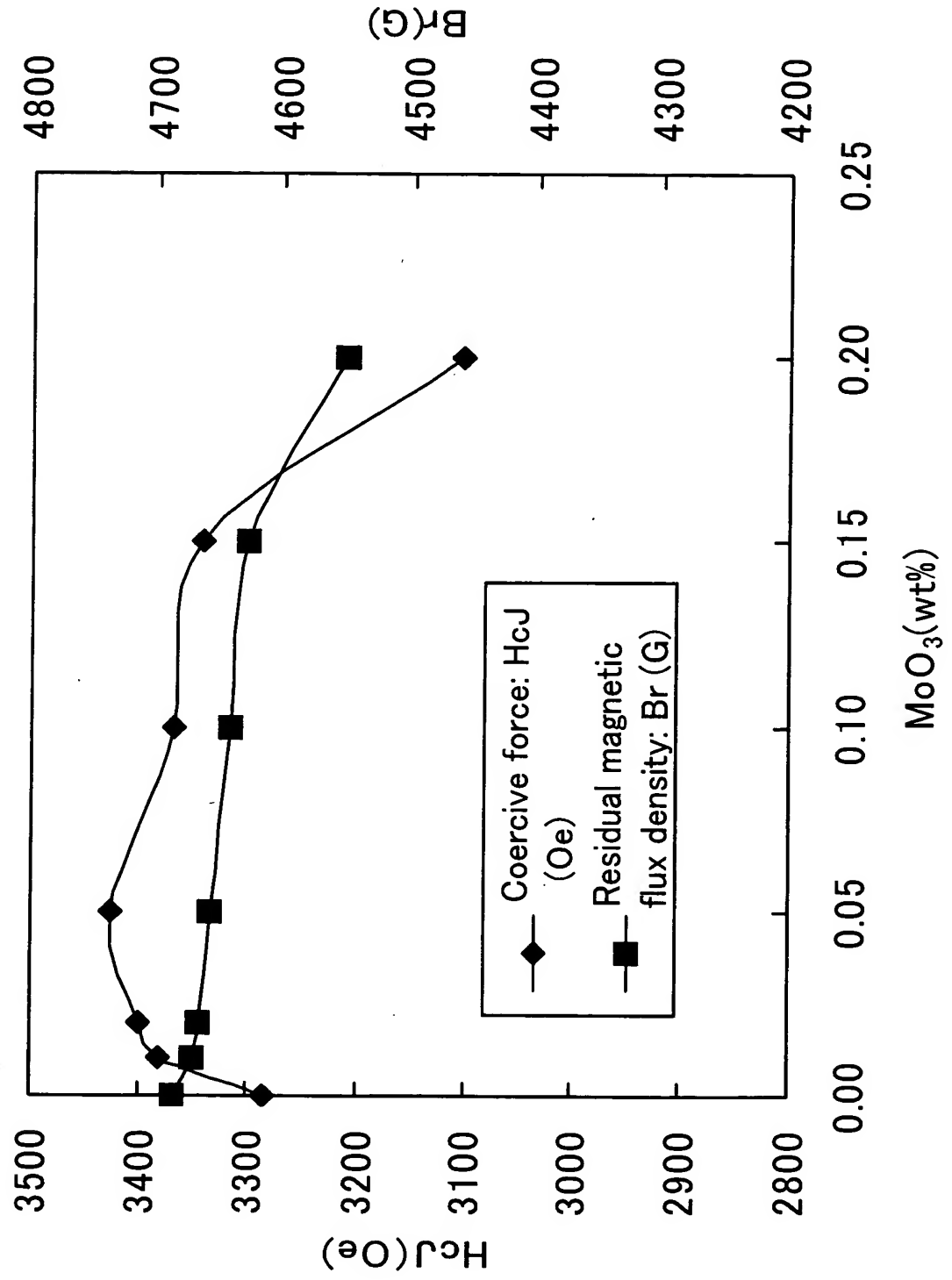


FIG. 17

Composition analysis value		CaCO ₃ [wt%]	SiO ₂ [wt%]	Al ₂ O ₃ [wt%]	WO ₃ [wt%]	CeO ₂ [wt%]	MoO ₃ [wt%]	Mean grain size (μ m)
a	b							
1.9	16.2	1.0	0.5	0	-	-	-	0.86
				0.1	-	-	-	0.79
				0.3	-	-	-	0.80
				0.5	-	-	-	0.78
				1.0	-	-	-	0.79
2.0	16.0	0.7	0.45	-	0	-	-	0.85
				-	0.1	-	-	0.80
				-	0.5	-	-	0.75
				-	1.0	-	-	0.75
				-	-	0	-	0.61
2.0	16.0	0.7	0.60	-	-	0.1	-	0.52
				-	-	0.1	-	0.53
				-	-	0.5	-	0.60
				-	-	-	0.00	0.61
				-	-	-	0.01	0.52
2.1	15.8	0.7	0.6	-	-	-	0.02	0.52
				-	-	-	0.05	0.55
				-	-	-	0.10	0.58
				-	-	-	0.15	0.59
				-	-	-	0.20	0.65

FIG. 18

Composition analysis value		CaCO ₃ [wt%]	SiO ₂ [wt%]	Additive [wt%]	Coercive force (HcJ) [Oe]	Residual Magnetic Flux Density (Br) [G]	Phases	Note
a	b							
2.0	16.0	0.45	0.7	0	2948	4452	W phase	Prepared under the same conditions as in Examples 1-1 and 1-2
				Ta ₂ O ₃ 0.1	2906	4489		
				Sm ₂ O ₃ 0.03	2833	4510		
2.0	16.0	0.7	0.6	0	3284	4666	W phase	Prepared under the same conditions as in Examples 1-3 and 1-4
				TiO ₂ 0.02	3046	4409	W phase + M phase + H phase	
				0.05	3095	4345		
				0.1	3010	4364		
				CuO ₂ 0.05	2900	4421	W phase + M phase + H phase	
				0.1	2796	4421		
				0.2	2631	4406		
				0.3	2540	4428		

FIG. 19

	Ga ₂ O ₃ [wt%]	Al ₂ O ₃ [wt%]	Mixed composition	Composition analysis value			HcJ [Oe]	Br [G]	Mean grain size [μ m]
			a+b	a	b	x			
Example 2-1	0.0	—	18	1.76	13.84	0.37	3425	4675	0.53
	0.1	—					3527	4678	—
	2.0	—					3644	4675	0.513
	3.0	—					3824	4647	—
	4.0	—					4157	4617	0.482
	5.0	—					4218	4595	—
	6.0	—					4255	4547	—
	7.0	—					4230	4510	0.476
	12.0	—					3931	4201	—
	16.0	—					3455	3778	—
Example 2-2	0.0	—	18	1.89	13.63	0.33	3461	4602	—
	0.2	—					3559	4626	—
	0.6	—					3589	4614	—
	1.0	—					3681	4623	—
	2.0	—					3834	4611	—
	4.0	—					4078	4577	—
	6.0	—					4316	4510	—
	8.0	—					4340	4434	—
Example 2-3	3.0	—	18	1.60	14.00	0	3304	4540	—
Example 2-4	2.0	0.6	18	1.76	13.84	0.37	3974	4669	—

Note :

$$a, a+b: \text{Sr}_{(1-x)}\text{Ba}_x\text{Fe}^{2+}_a\text{Fe}^{3+}_b\text{O}_{27}$$

During mixing $a=0$ (Fe^{2+} generated from calcining)

FIG. 20

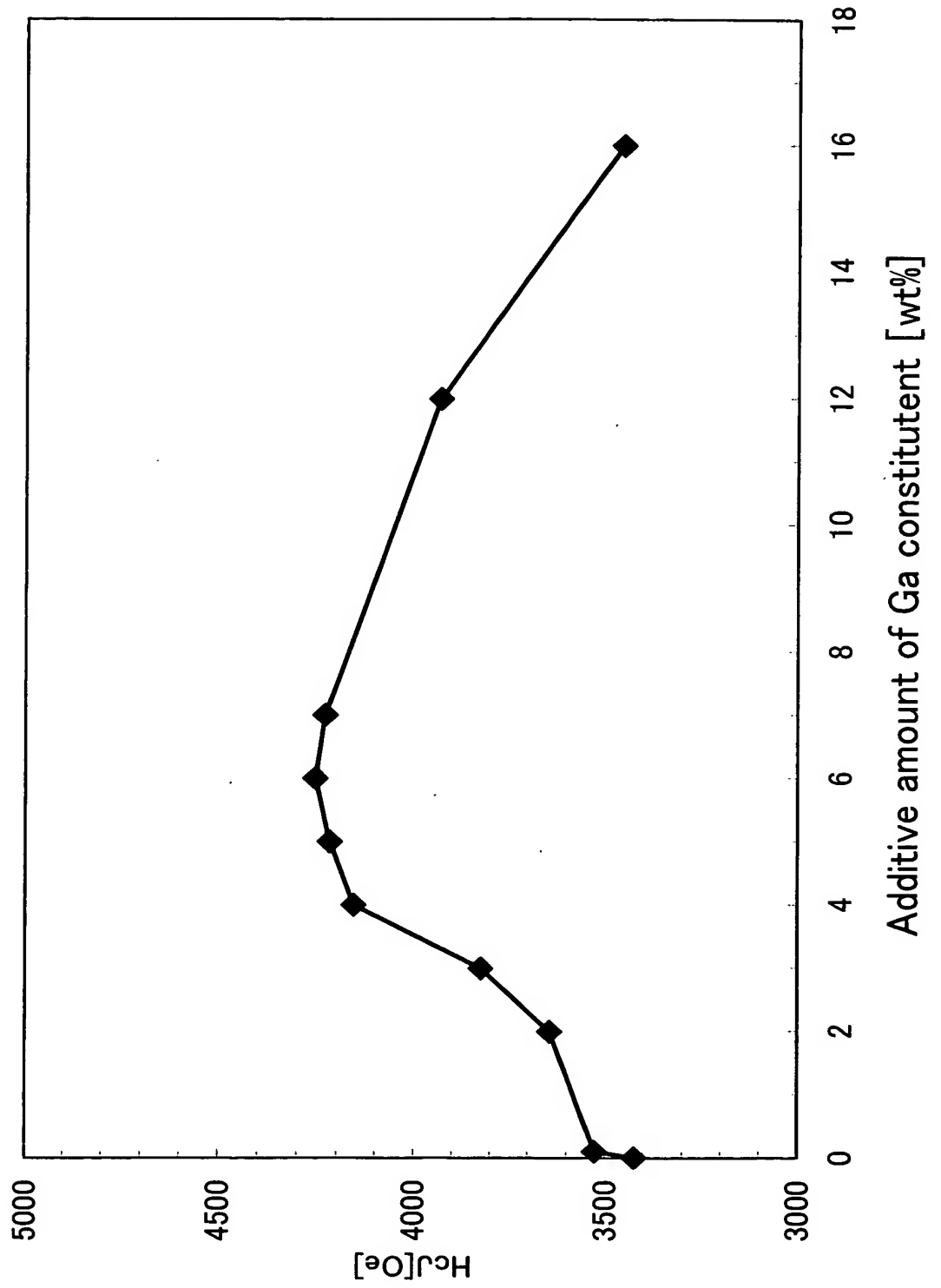


FIG. 21

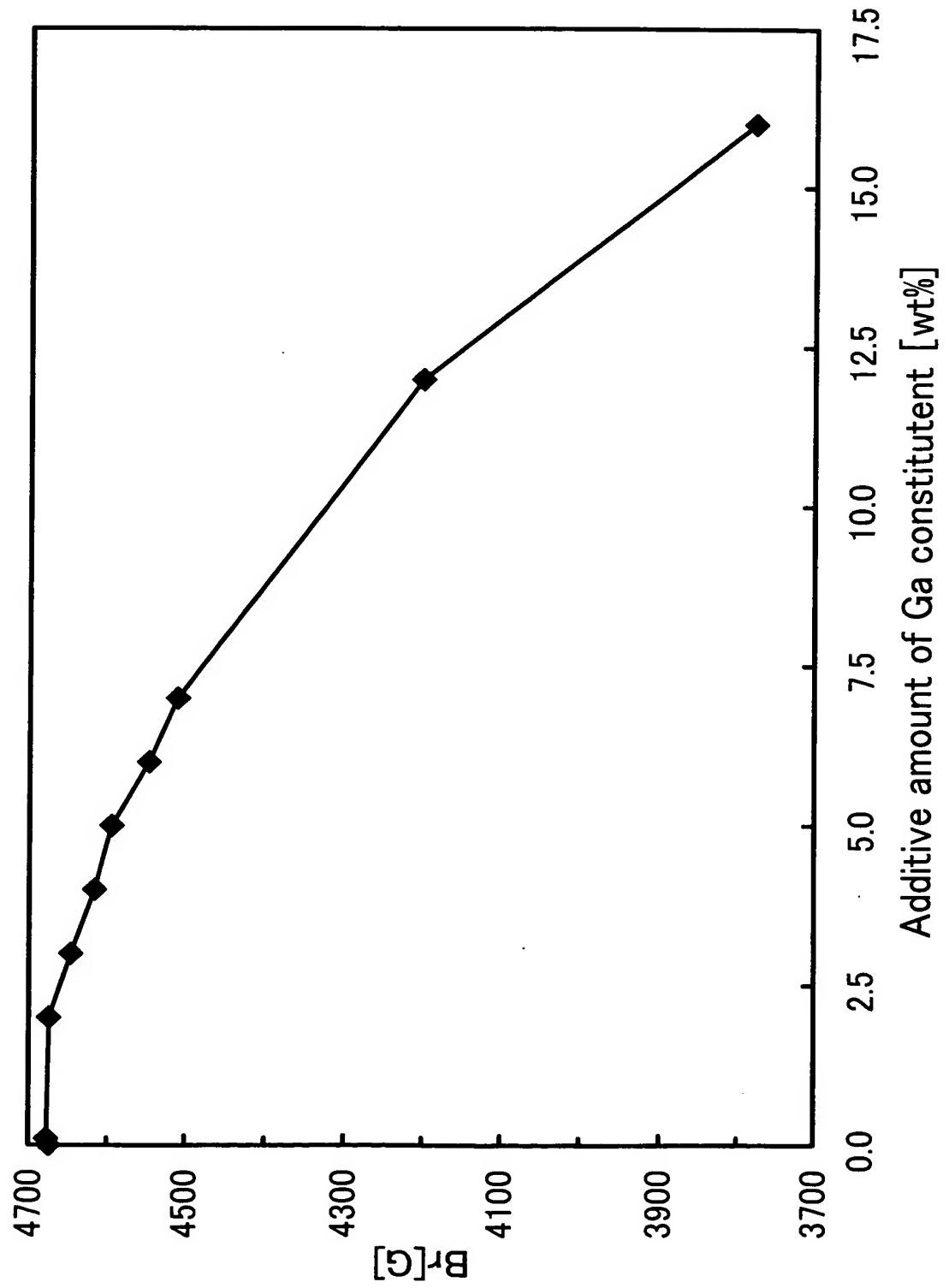


FIG. 22

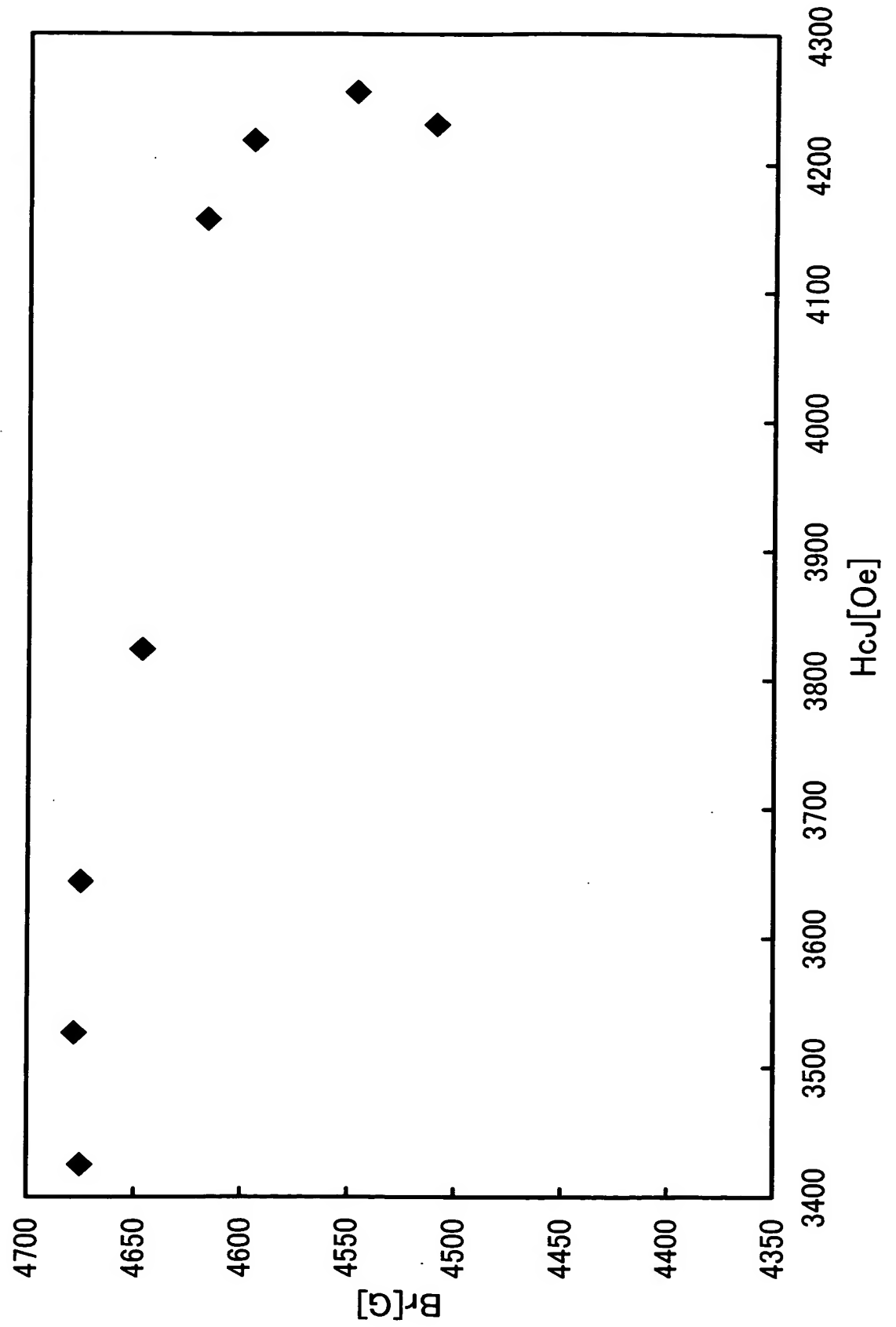


FIG. 23

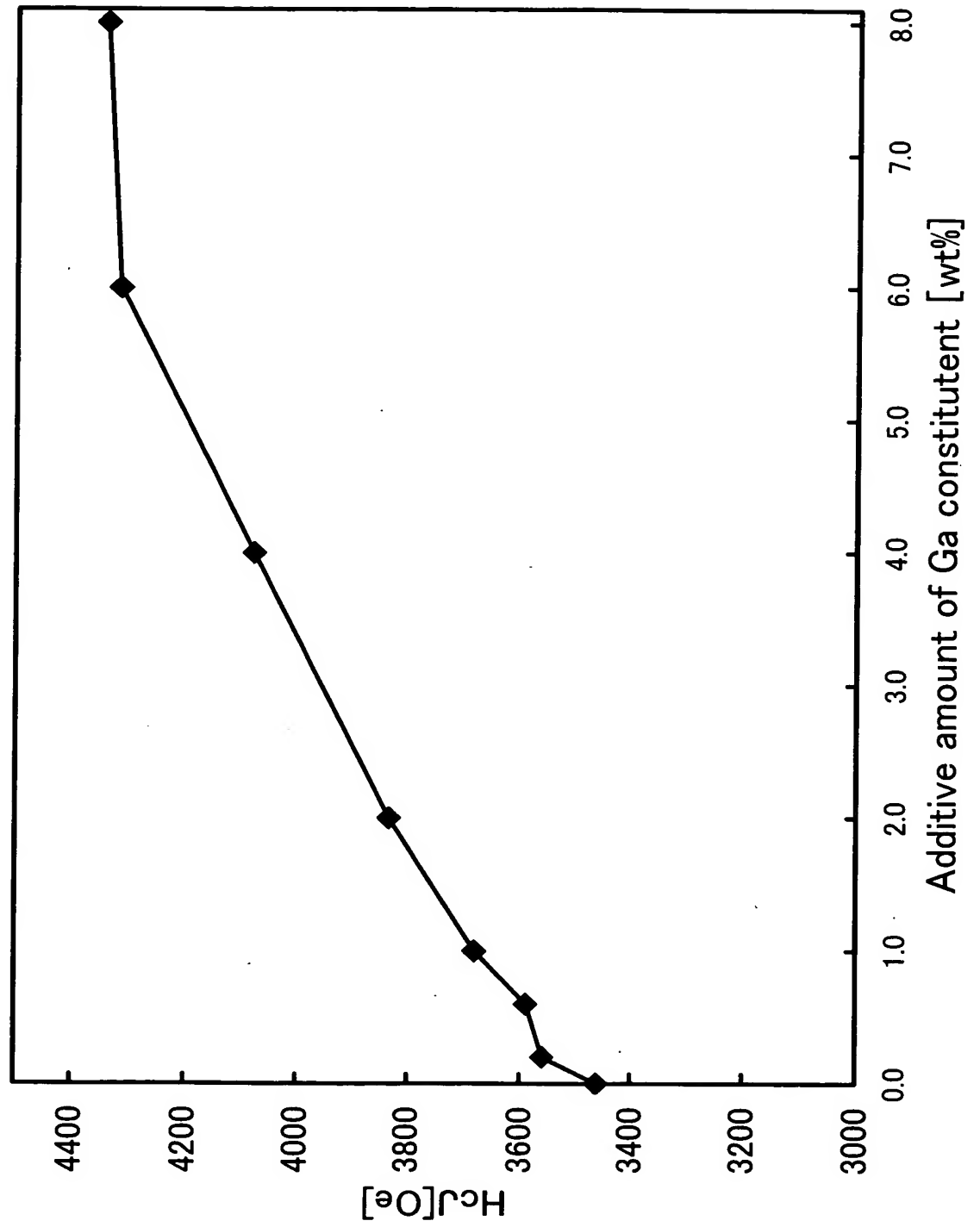


FIG. 24

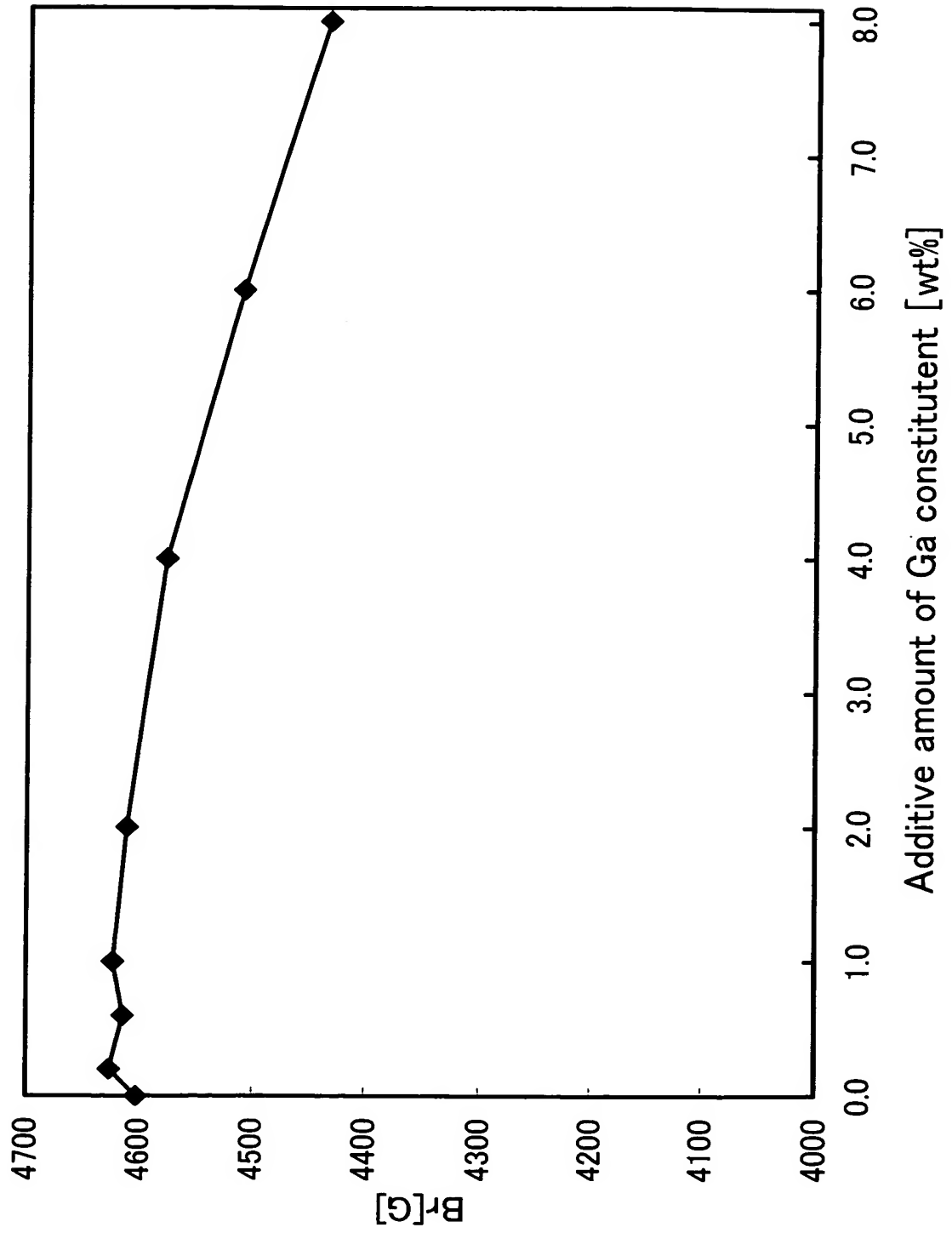


FIG. 25

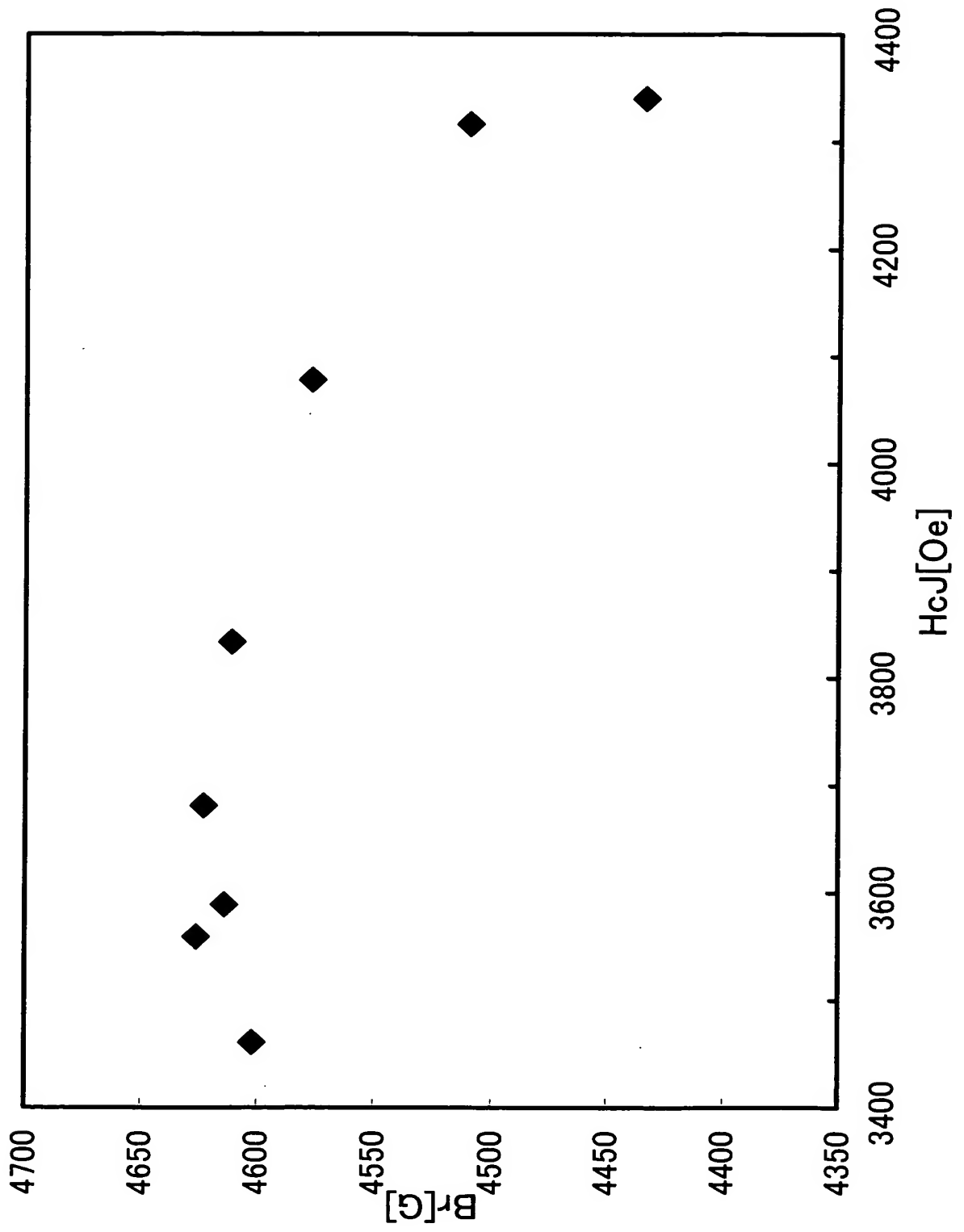


FIG. 26

No.	Ga constituent		Mixed composition	Composition analysis value			HcJ [Oe]	Br [G]
	Addition timing	Additive amount [wt%]		a+b	a	x		
Example 3-1	during mixing	2.0	18	15.5	1.89	0.33	3766	4547
		4.0					3980	4544
		6.0					3888	4470
Example 3-2	on milling (on second milling)	2.0					3834	4611
		4.0					4078	4577
		6.0					4316	4510
Example 3-3	on milling (on first milling)	4.0				4145	4565	

Note:

a, a+b: $AFe^{2+}_aFe^{3+}_bO_{27}$ (wherein A is Sr and Ba)

During mixing a=0 (Fe^{2+} generated from calcining)

FIG. 27

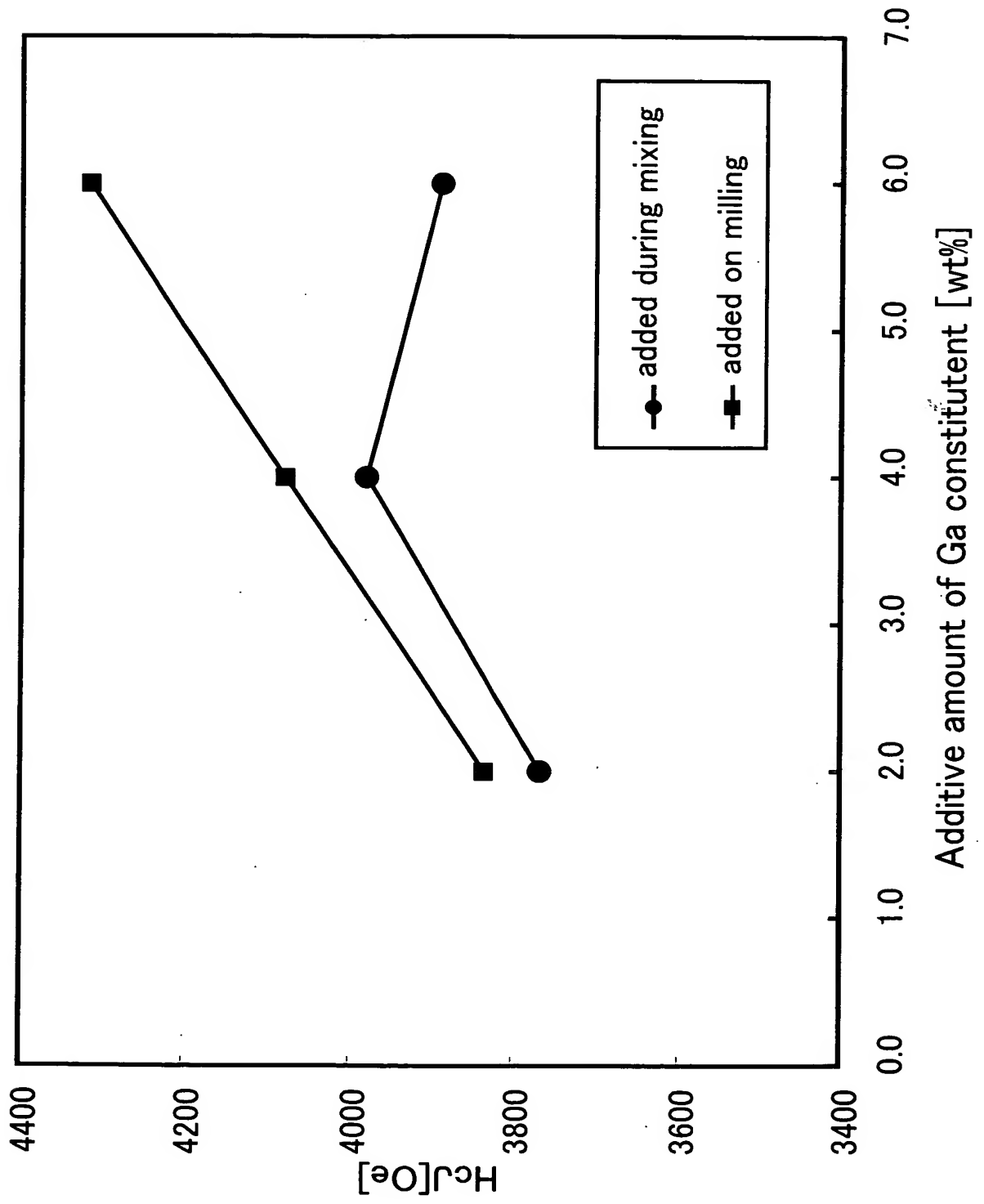


FIG. 28

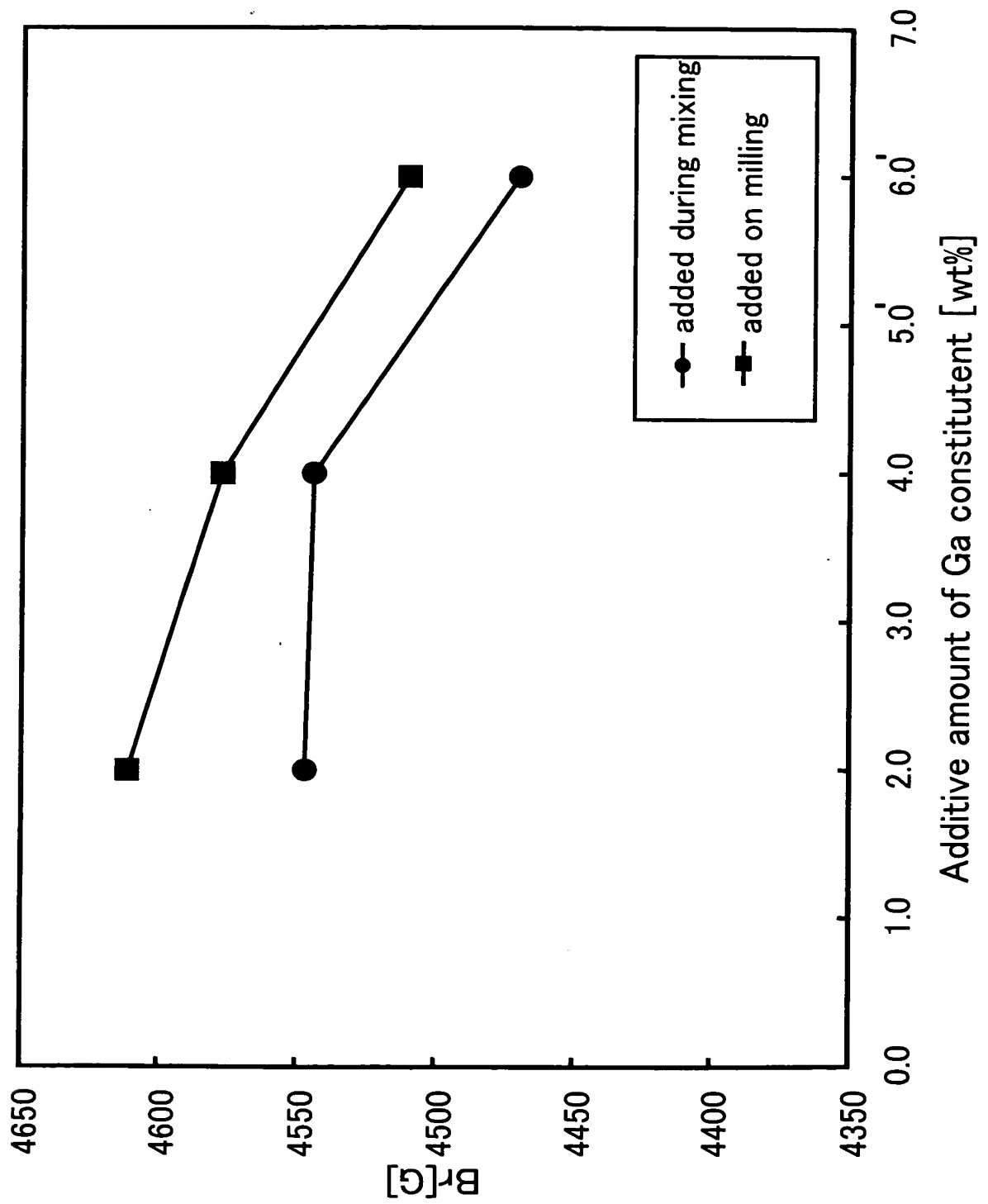


FIG. 29

	Additive amount[wt%]		Mixed composition	Composition analysis value		HcJ [Oe]	Br [G]
	SrCO ₃	BaCO ₃		a+b	a		
Example 4-1	0	2.10	18.9	16.6	1.97	3666	4492
		2.45		16.2		3760	4571
		2.80		15.9		4053	4537
	0.35	1.75		16.4		3696	4510
		2.10		16.0		3827	4550
		2.45		15.6		4017	4547
	0.70	1.40		16.3		4017	4574
		1.75		16.0		4011	4580
		2.10		15.7		4303	4571
		2.45		15.4		4133	4571
	1.05	1.40		15.9		3949	4550
		1.75		15.6		4279	4547
		2.10		15.3		4120	4510
	1.40	1.40		15.5		4017	4473
		1.75		15.2		4151	4473
	1.75	1.40		15.1		4023	4504
Example 4-2	0.70	1.40		16.3		3895	4690
	1.05	1.40		15.9		4078	4629
	1.40	1.40		15.5		3821	4568

Note:

a, a+b: AFe²⁺_aFe³⁺_bO₂₇ (wherein A is Sr and Ba)

During mixing a=0 (Fe²⁺ generated from calcining)

FIG. 30

	Ga ₂ O ₃ [wt%]	Al ₂ O ₃ [wt%]	HcJ [Oe]	Br [G]	sintered body composition (oxide)
Example 5-1	0	—	709	4916	SrZn _{1.5} Fe ₁₅
	0.2	—	721	4873	
	0.4	—	751	4852	
	0.8	—	782	4812	
Example 5-2	—	0	711	4895	SrZn _{1.3} Fe ₁₄
	—	0.1	777	4879	
	—	0.5	1005	4801	
	—	1.5	1651	4602	
Example 5-3	0.8	0.6	1103	4707	SrZn _{1.2} Fe ₁₃